FLOWERING OF TARO, COLOCASIA ESCULENTA (L.) SCHOTT, ARACEAE, IN NEW ZEALAND

R. C. COOPER
Auckland Institute and Museum

Abstract. The flowering of taro, *Colocasia esculenta* (L.) Schott, in New Zealand is recorded. The male flowers lack pollen. So far, ripe fruits have not been found.

Colenso (1868, p. 30) recorded that taro in New Zealand "very rarely flowers and it has never been known to produce seed." Best (1931, p. 7) mentioned that the Rev. T. G. Hammond had seen a flowering specimen of taro at Hokianga.

Flowering specimens, collected in New Zealand and preserved in the Cheeseman Herbarium of the Auckland Institute and Museum, are listed in the following table:

Column 1: Herbarium number; 2: Locality; 3: Collector; 4 - 9 Measurements of length: 4: Spathe tube; 5: Female flowers; 6: Sterile flowers; 7: Male flowers; 8: Sterile appendange; 9: Complete spadix. All measurements are in cm.

1.	2.	3.	4.	5.	6.	7.	8.	9.
477	Waimate, Bay of Islands, February 1895	T. F. Cheeseman	15.5	An empty spathe				
5476	Kaitaia, April 1921	R. H. Matthews	22.5	3.1	2.3	4.9	4.6	14.9
44326	Met. station, Raoul Island, June 1956	R. C. Cooper	16.4	1.8	1.2	2.5	.5	6.0
70451	Garden, 7 Edmund Street, Auckland, April 1962	A. T. Pycroft	26.6	3.0	2.0	6.5	2.3	13.8
90327	Ngaire Bay, south of Whangaroa, Dec. 1963	Miss A. Leahy	24.1	1.9	2.5	2.4	2.3	9.1
90328	Kerikeri beach, Dec. 1963	Miss A. Leahy	22.8	5.5	—	1.7	2.0	9.2
90329	Kerikeri beach, Dec. 1963	Miss A. Leahy	26.2	5.6	—	2.5	.6	8.7
90330	Kerikeri beach, Dec. 1963	Miss A. Leahy	25.6	5.5	—	2.6	.6	8.7
118571	Whareora, Whangarei, September 1968	J. C. Nicholson	18.1	3.8	1.1	3.7	3.2	11.8

Colocasia esculenta (L.) Schott has two botanical varieties:

var *esculenta* (formerly *typica*), in which the sterile appendage of the spadix is shorter in length than the male inflorescence. This variety has also been defined as that in which the sterile appendage is short and is freed when the spathe tube opens.

var. *antiquorum* (Schott) Hubbard & Rehder, in which the sterile appendage is equal to or greater than the length of the male flowers. This variety has also been defined as that in which the appendage is

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longer, and remains caught in the terminal part of the spathe when the tube opens.

The two kinds of spadix, with the spathe removed, are shown in Figs. 1 & 2.

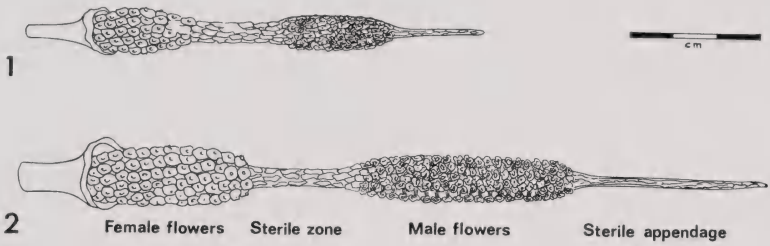

FIG. 1—Spadix of *Colocasia esculenta* (L.) Schott var. *esculenta* with the spathe removed.

FIG. 2—Spadix of *Colocasia esculenta* (L.) Schott var. *antiquorum* (Schott) Hubbard & Rehder, with the spathe removed.

From the measurements, it seems that number 44326, collected near the meteorological station on Raoul Island in June 1956 by R. C. Cooper; 70451, collected at 7 Edmund Street, Auckland, in April 1962 by A. T. Pycroft; and 90327-90330, collected at Ngaire Bay and Kerikeri in December, 1963, by Miss A. Leahy; are var. *esculenta*. Number 44326 may be a recent introduction to Raoul Island; Mr. Pycroft's plant was obtained about 1909 from Waikare, Bay of Islands, and is reputed to be one of the clones grown by the Maori people in the past; the taros collected by Miss Leahy at Ngaire Bay and Kerikeri grow wild on the coast and may be relics of past Maori plantings, although a local resident said that the tubers are very bitter and are not eaten.

From the measurements, it seems that number 5476, collected at Kaitaia in April 1921 by R. H. Matthews; and number 118571, grown at Whareora in September 1968 by J. C. Nicholson; are var. *antiquorum*. Unfortunately, nothing is known of the history of Mr. Matthews' taro. Mr. Nicholson's was obtained from "a Maori lady".

Spadices numbered 90328, 90329 and 90330, collected by Miss Leahy near Kerikeri, lack a sterile zone between the male and female flowers. The synangia or fused anthers of male flowers of numbers 44326, 70451, 90327-90330 (var. *esculenta*), and 5476 and 118571 (var. *antiquorum*) are 1-1.5 mm tall, and thin (Fig. 3). There are a few grains in the synangia of 118571, but the others lack pollen. Synangia from a spadix collected in Fiji and numbered 11169 in the Herbarium, are 1 mm tall, thicker, and crowded with pollen grains. They are illustrated for comparison in Fig. 4.

In June 1956 the writer collected fruiting specimens of taros growing wild in a seepage of fresh water at Lava Point, Raoul Island. These are numbered 44359 in the Herbarium. In all specimens the portion of the spathe above the constriction has opened and withered away, but the fruits on the spadix are stunted and lack seeds. Another fruiting specimen, numbered 71737, was obtained from Mr. Pycroft's plant in May, 1962.

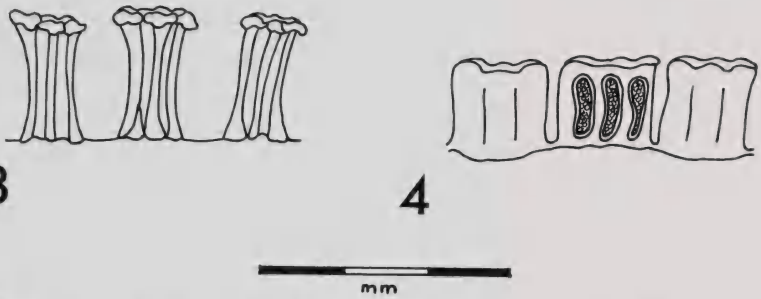

FIG. 3—Synangia or fused anthers of *Colocasia esculenta* (L.) Schott var. *esculenta*, collected in New Zealand.

FIG. 4—Synangia of *C. esculenta* var. *esculenta*, collected in Fiji.

Again, although the spathe opened and withered, the fruits on the spadix are dwarfed and do not contain seeds.

The flowering of Mr. Pycroft's taro in April 1962 was described in several newspapers, and 11 readers wrote or telephoned to give information regarding the flowering of other taro plants. All were asked to look for ripe fruits, without success.

In December 1963 when Miss Leahy collected a number of taros at Ngaire Beach and Kerikeri, she brought one in bud to the Museum and this plant was grown in the Museum courtyard. The spadix developed to anthesis, but it withered without producing seeds. The spadix is numbered 90326 in the Herbarium.

In March 1964 Mrs. T. Harris of Henderson forwarded a withered flower from a taro in her garden. This specimen is numbered 98108 in the Herbarium. Mrs. Harris advised that the plant was from a clone formerly grown by the Maori people. The fruits on the spadix are stunted and the seeds have not developed. Again, in April 1967 Mrs. Harris forwarded a fruiting spadix from another taro in her garden. She advised that this second plant was from a Samoan clone and had been grown for three years. The fruits are small and lack ripe seeds.

Mr. Pycroft's plant has been divided in the past to provide offshoots for other gardeners, and one of these offshoots flowered in February 1968. Mr. Ralph Pycroft collected two spadices when spathes and stalks withered, and presented them to the Museum. They are numbered 118208 and 118209 in the Herbarium. Although the ovaries enlarged, the ovules have not ripened. One of these spadices is shown in Fig. 5, surrounded by the lower portion of the spathe.

In September 1968 Mr. J. C. Nicholson sent a fruiting spadix from his plant at Whareora. Again, the fruits are small and the ovules have not ripened.

To sum up these results, fruiting spadices numbered 44359, 71737, 90326, 118208, 118209 (all var. *esculenta*), 118571 (var. *antiquorum*), and 98108 (var. not determined), from New Zealand sources, have small

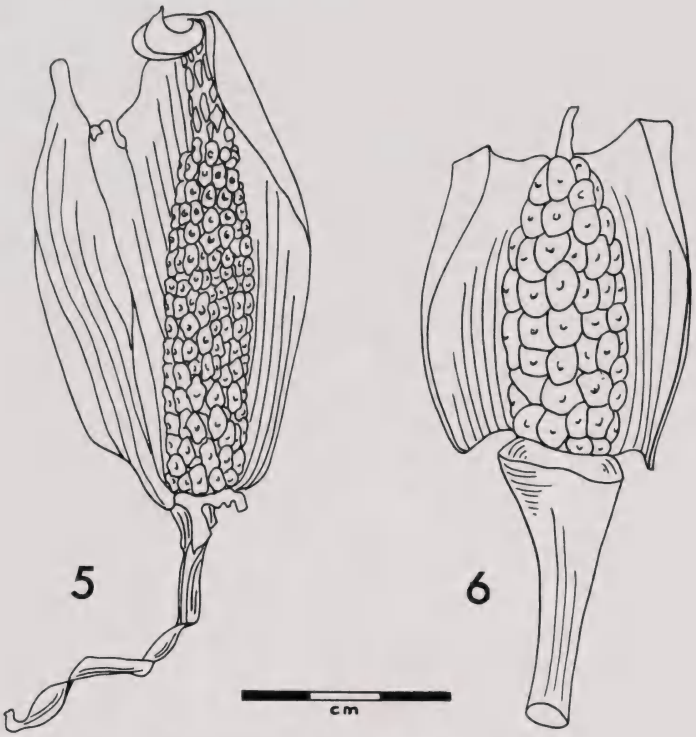

FIG. 5—Fruit of *Colocasia esculenta* (L.) Schott var. *esculenta*, collected by Mr. Ralph Pycroft at Auckland, New Zealand.

FIG. 6—Fruit of *C. esculenta* var. *esculenta* (?), collected by Dr. J. Barrau at the Wosi River, near Manokwari, Netherlands New Guinea, now West Irian.

fruits, and white ovules (when fresh). Spathes and stalks wither, and the fruits fail to ripen seeds. A fruiting specimen from New Guinea that yielded seeds is shown for comparison in Fig. 6.

I am indebted to Miss A. Leahy, Mrs. T. Harris, Dr. J. Barrau, Mr. and Mrs. A. T. Pycroft, Mr. Ralph Pycroft and Mr. J. C. Nicholson for specimens, and to Miss J. H. Goulding for drawings.

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